

WHAT IS CLAIMED IS:

1. A structure of a flash memory comprising:

a first oxide layer positioned on a substrate;

a dielectric layer having a high dielectric constant positioned on the first oxide layer;

a second oxide layer positioned on the dielectric layer having the high dielectric constant, wherein the first oxide layer, the dielectric layer having the high dielectric constant and the second oxide layer together form a charge trapping layer; and

a gate located on the second oxide layer of the charge trapping layer; and

10 a source/drain region located at two lateral sides of the substrate.

2. The structure of claim 1, wherein a band gap of the dielectric layer having the high dielectric constant is smaller than that of silicon oxide (SiO_2).

3. The structure of claim 1, wherein the dielectric constant of the dielectric layer having the high dielectric constant is greater than 8.

15 4. The structure of claim 1, wherein the material of the dielectric layer having the high dielectric constant is selected from a group consisting of Al_2O_3 , Y_2O_3 , ZrSi_xO_y , HfSi_xO_y , La_2O_3 , ZrO_2 , HfO_2 , Ta_2O_5 , Pr_2O_3 and TiO_2 .

20 5. The structure of claim 1, wherein the material of the dielectric layer having the high dielectric constant is a mixture of materials selected from the a group consisting of Al_2O_3 , Y_2O_3 , ZrSi_xO_y , HfSi_xO_y , La_2O_3 , ZrO_2 , HfO_2 , Ta_2O_5 , Pr_2O_3 and TiO_2 .

6. The structure of claim 1, wherein the dielectric layer having the high dielectric constant is a stacked layer having layers made of materials selected from a group consisting of Al_2O_3 , Y_2O_3 , ZrSi_xO_y , HfSi_xO_y , La_2O_3 , ZrO_2 , HfO_2 , Ta_2O_5 , Pr_2O_3 and TiO_2 .

7. A structure of a flash memory comprising:

a first oxide layer positioned on a substrate;

a dielectric layer having a high dielectric constant positioned on the first oxide layer, wherein the dielectric layer and the first oxide layer together form a charge

5 trapping layer; and

a gate positioned on the dielectric layer having the high dielectric constant; and

a source/drain region positioned at two lateral sides of the substrate.

8. The structure of claim 7, wherein a band gap of the dielectric layer having the high dielectric constant is larger than that of silicon oxide (SiO_2).

10 9. The structure of claim 7, wherein the band gap of the dielectric layer having the high dielectric constant is equal to that of silicon oxide (SiO_2).

10. The structure of claim 7, wherein the material of the dielectric layer having the high dielectric constant is selected from a group consisting of Al_2O_3 , Y_2O_3 , ZrSi_xO_y , HfSi_xO_y , La_2O_3 , ZrO_2 , HfO_2 , Ta_2O_5 , Pr_2O_3 and TiO_2 .

15 11. The structure of Claim 7, wherein the material of the dielectric layer having the high dielectric constant is a mixture of materials selected from a group consisting of Al_2O_3 , Y_2O_3 , ZrSi_xO_y , HfSi_xO_y , La_2O_3 , ZrO_2 , HfO_2 , Ta_2O_5 , Pr_2O_3 and TiO_2 .

20 12. The structure of claim 7, wherein the dielectric layer having the high dielectric constant is a stacked layer having layers made of materials selected from a group consisting of Al_2O_3 , Y_2O_3 , ZrSi_xO_y , HfSi_xO_y , La_2O_3 , ZrO_2 , HfO_2 , Ta_2O_5 , Pr_2O_3 and TiO_2 .